CONTRIBUTION TO THE KNOWLEDGE OF MOULTING AND GROWTH OF CALLINECTES ARCUATUS ORDWAY, 1863 (BRACHYURA, PORTUNIDAE) IN BAJA CALIFORNIA SUR, MEXICO

BY

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ABSTRACT

Growth and moulting cycle of the crab, Callinectes arcuatus were studied. Specimens were divided into four experimental groups, depending on size. A group of eyestalk-ablated crabs was also included. The smallest crabs had the largest increase in size on a percentage basis. The average growth of the crabs after moulting, as well as the soft crab condition, are reported and discussed.

INTRODUCTION

There is an important commercial potential for portunid crabs as a fishery resource, especially those of the genus Callinectes because they are abundant,
large, and widely distributed (González-Ramírez et al., 1996). Three *Callinectes* species are widely distributed along the Pacific coast of Mexico: *Callinectes arcuatus* Ordway, 1863, *C. toxotes* Ordway, 1863, and *C. bellicosus* (Stimpson, 1859) (cf. Paul, 1982; Arréola-Lizárraga et al., 2003). The yield of *Callinectes* crabs in Mexico was 4,704 metric tones from January to March 2005 (Comisión Nacional de Acuacultura y Pesca). *Callinectes arcuatus* is distributed from the Baja California Peninsula to Ecuador (Hendrickx, 1995), and could be suitable for soft shell crab production in Mexico.

The discontinuous process of growth by moulting in crustaceans (Luppi et al., 2004; Josileen & Menon, 2005) yields newly moulted, hence soft individuals. Soft shell crabs have become a high-value product in several countries. From an economic and trade perspective, understanding the moulting process is important if producers are to obtain soft crabs (Oesterling, 1988). In Mexico, the current exploitation of soft crabs (*Callinectes sapidus* Rathbun, 1896) occurs to a limited degree along the coast of the Gulf of Mexico in the state of Veracruz (Hernández-Bernal, 1995).

The phenotypic patterns of moulting are useful to determine the crab’s moult stage and serve as a useful tool to determine when crabs will need to complete the moulting cycle and release the old shell (Davis et al., 2005). The techniques for moult-stage detection in soft crab production are actually well known for *Callinectes sapidus*, i.e., the Atlantic species (Lawlor et al., 1997; Perry et al., 2001). In the U.S.A., production of soft shell crabs is well established in Maryland, North Carolina, South Carolina, and Louisiana. Commercial crabbers harvest *Callinectes sapidus* and place the crabs in shedding systems according to their moult stage. The early pre-moult crab (D1) has a white line on the “finlet” (=the P5 dactylus) and will moult in approximately 7 to 10 days. The D2 pre-moult crab has a pink line and will moult in two to seven days. The D3 pre-moult line is red and the crab could moult momentarily, usually in less than one day (Oesterling, 1988). There are five basic commercial sizes for soft shell crabs (in cm): “whales” (>14.1), “jumbos” (12.8 to 14.1), “primes” (11.5 to 12.8), “hotels” (10.2 to 11.5), and “mediums” (8.7 to 10.2) (Oesterling, 1988).

Production of soft shell crabs along the Pacific Coast of Mexico, using native species, is still developing. Although there have been attempts to establish production systems, there is very little information available on phenotypic patterns of the mouling cycle and this approach is not frequently used (Fernández-Luna et al., 1999).

Fernández-Luna et al. (1999) described mouling patterns of *C. arcuatus* in Nayarit, Mexico, and more recently, the same phenomenon was studied by Wehrtmann & Mena-Castañeda (2003) in Costa Rica. Both studies demonstrated changes in the pattern of coloration, as well as changes in the structure of the...